Supporting Information

Synthesis of poly(sulfonate ester)s by ADMET polymerization

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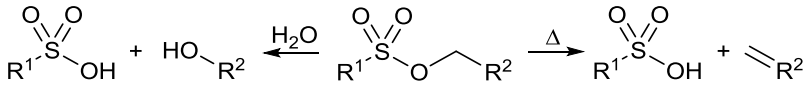


Scheme S1 Two possible degradation pathways of sulfonate esters.[1,2]

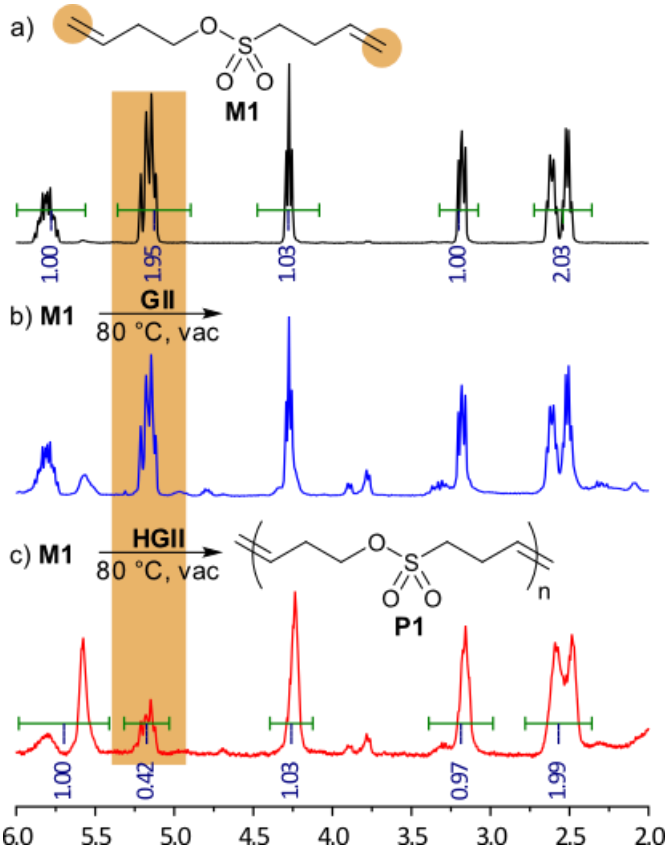


Figure S1 ^{1}H-NMR spectra in $CDCl_3$ of a) monomer **M1**; b) bulk ADMET polymerization attempt of **M1** with catalyst **GII** (1 mol %); c) ADMET polymerization attempt of **M1** with catalyst **HGII** (1 mol %), for which end-group analysis resulted in n = 5 or M_n = 800 g/mol.

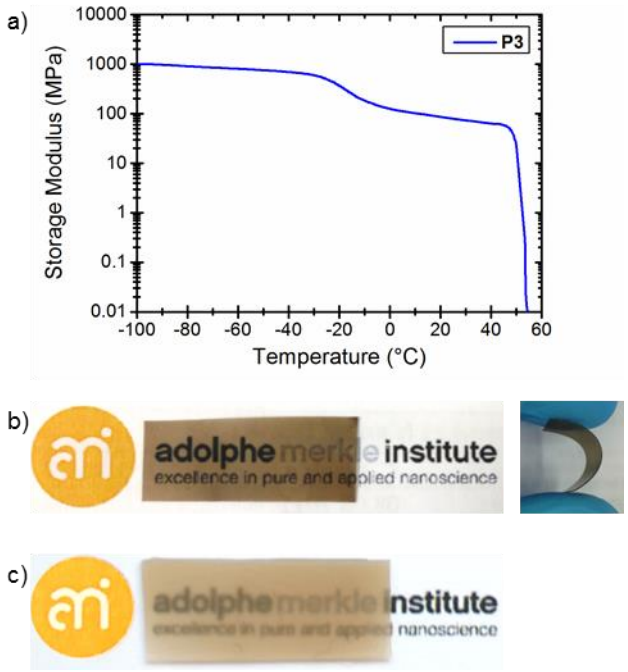


Figure S2 a) Representative DMTA trace of films of **P3** cast from $PhCH_3$ solution. Experiments were performed at a heating rate of 3 °C/min under N_2. b) Pictures of a solution cast film of **P3** ($PhCH_3$, 30 °C), and c) a melt-processed film of **HP3.** Films of **HP3** are visibly more opaque.

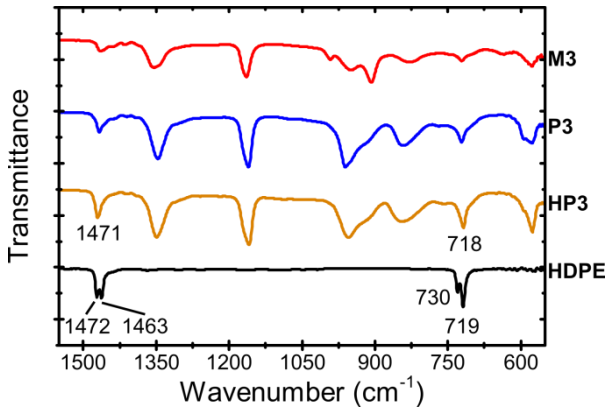
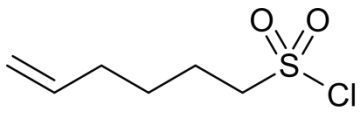


Figure S3 FT-IR spectra of **M3**, **P3**, **HP3**, and **HDPE**.



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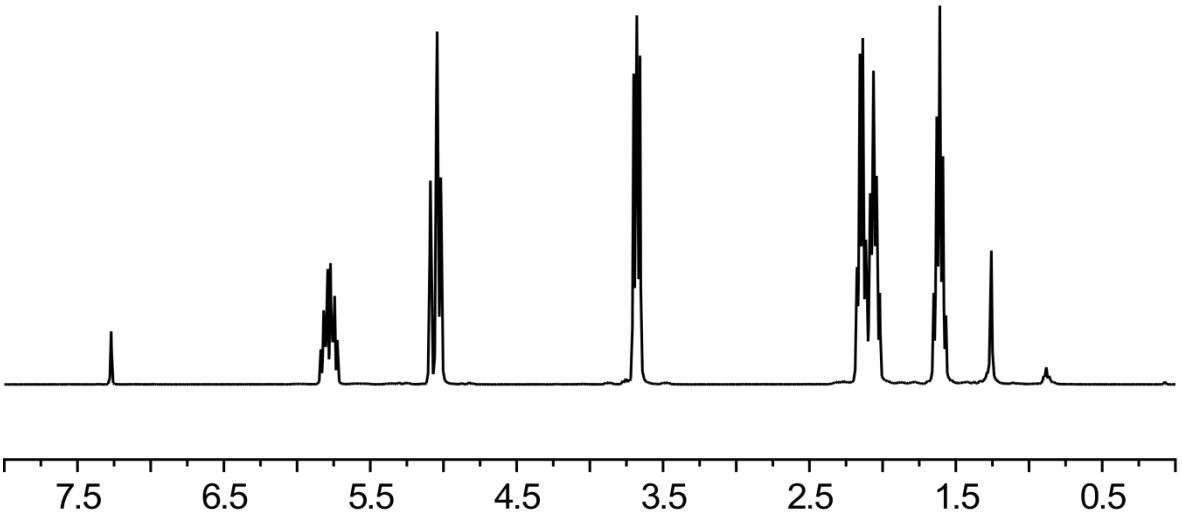
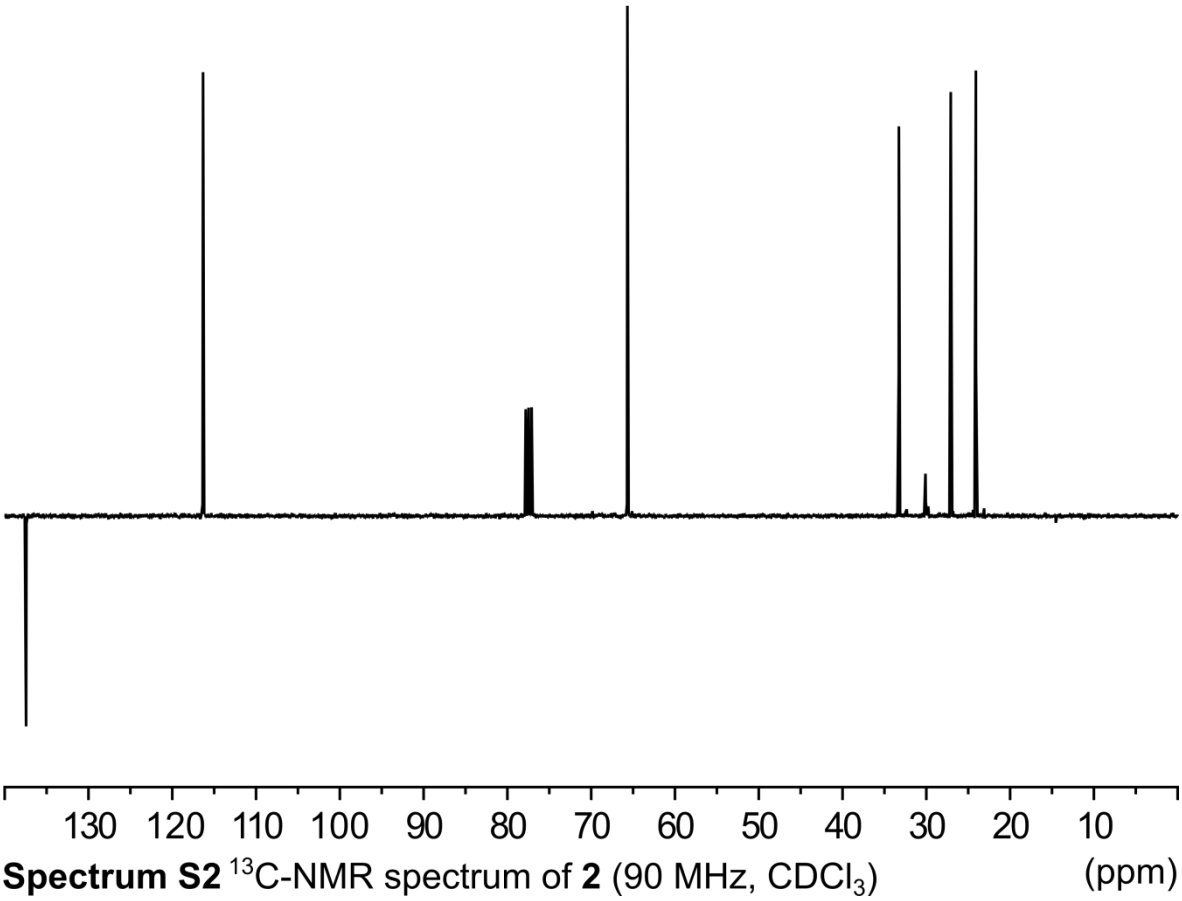
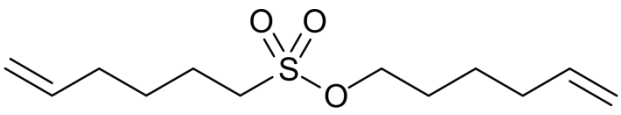


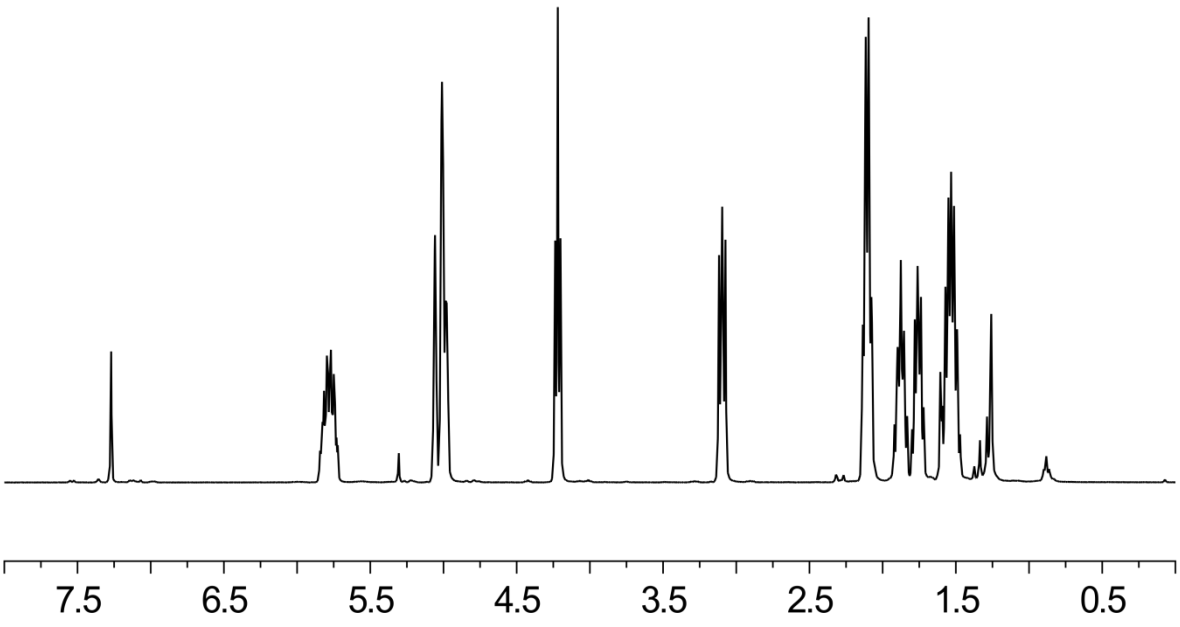
Spectrum S1 ^{1}H-NMR spectrum of **2** (360 MHz, $CDCl_3$)



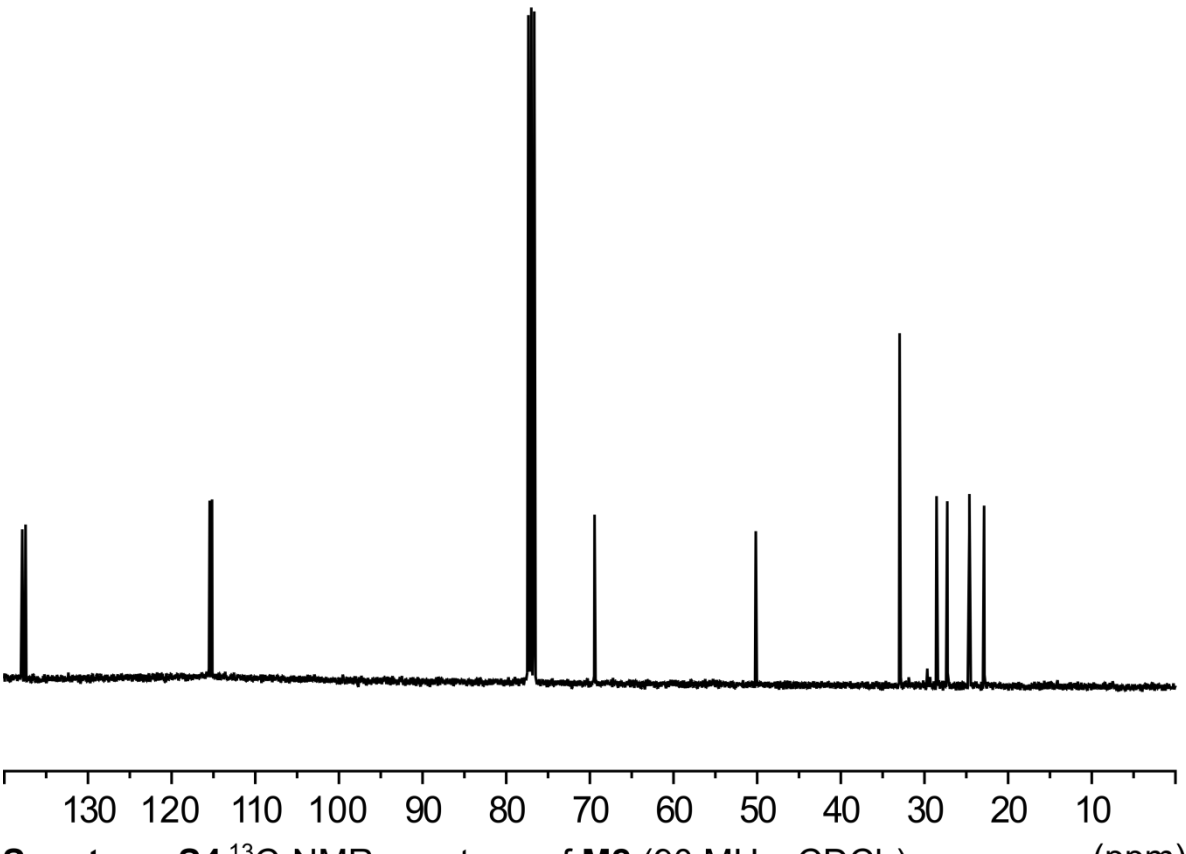
Spectrum S2 ^{13}C-NMR spectrum of **2** (90 MHz, $CDCl_3$)



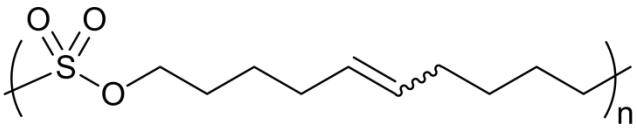
M2



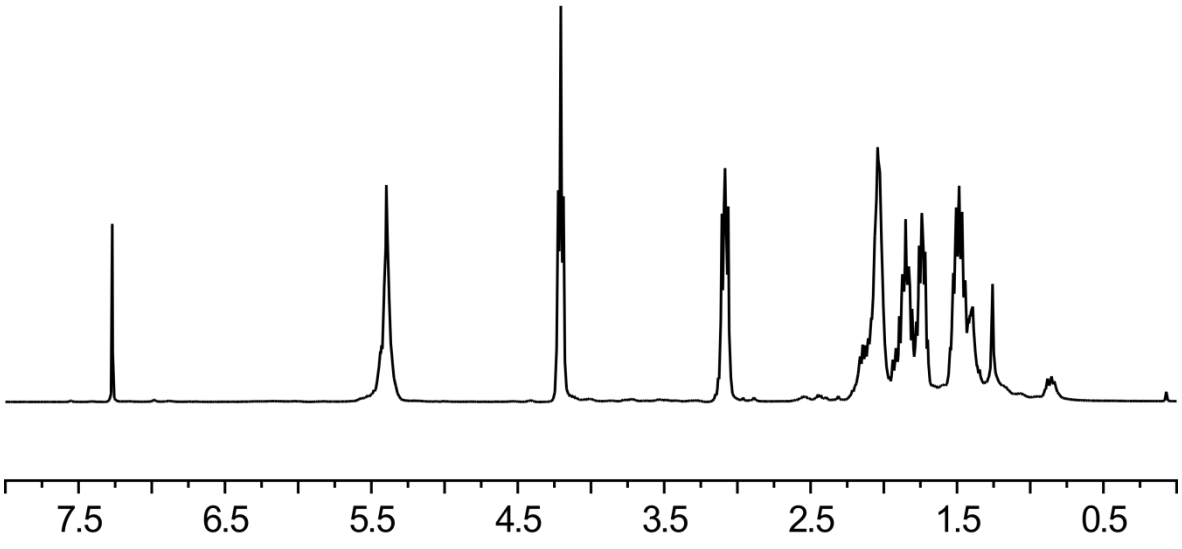
Spectrum S3 ^{1}H-NMR spectrum of **M2** (360 MHz, $CDCl_3$)



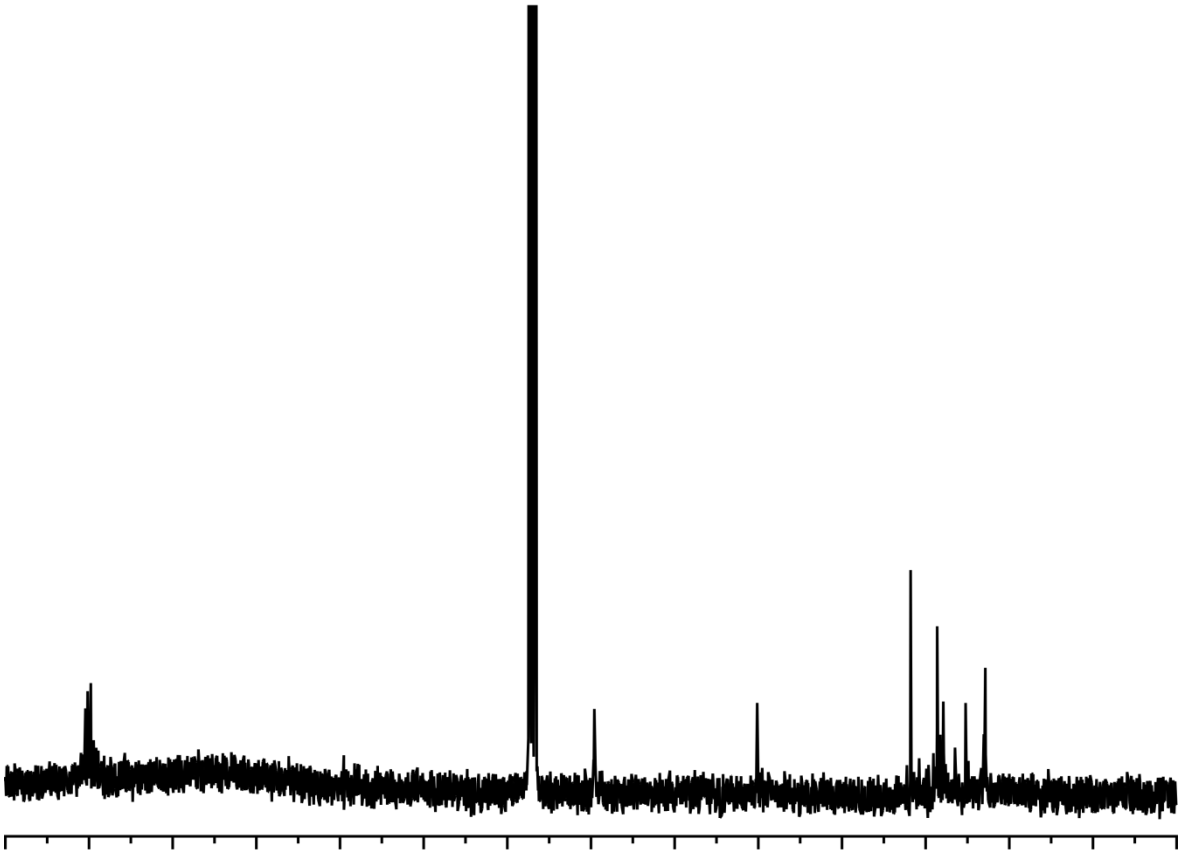
Spectrum S4 ^{13}C-NMR spectrum of **M2** (90 MHz, $CDCl_3$)



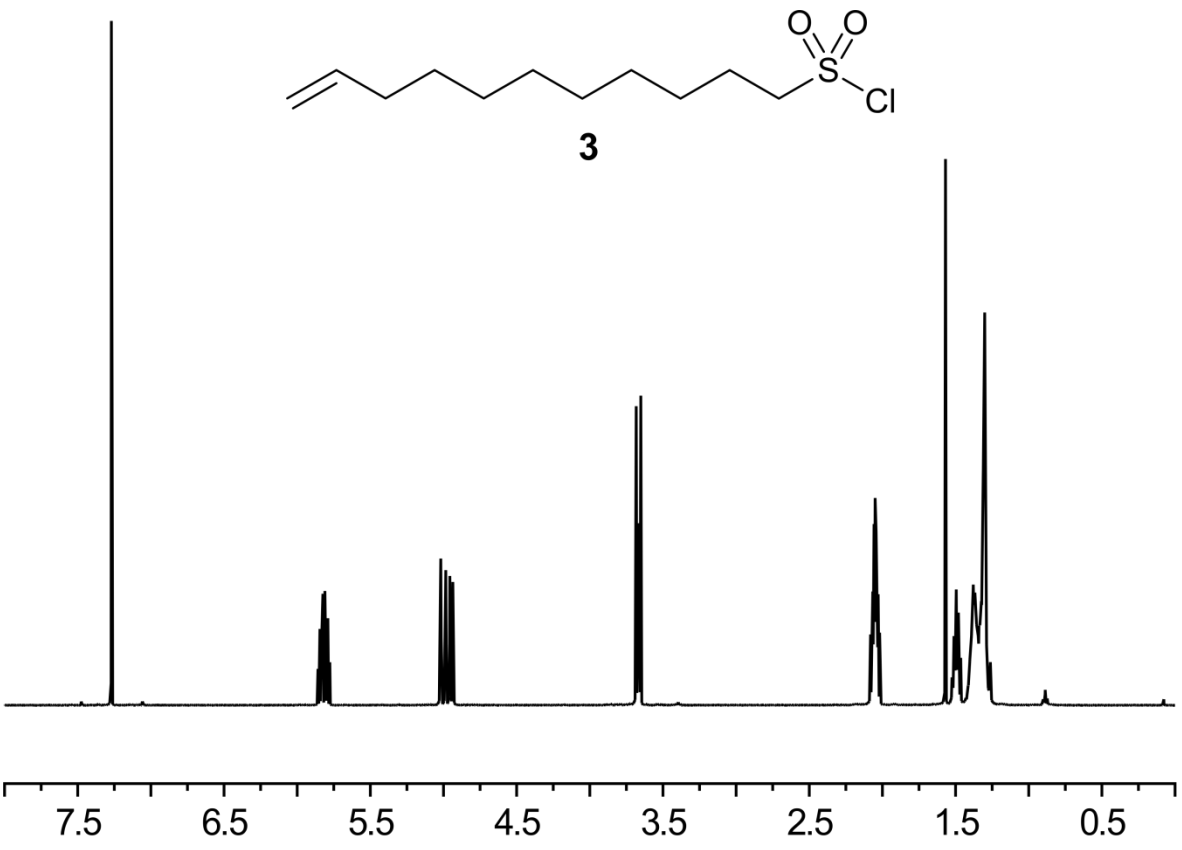
P2



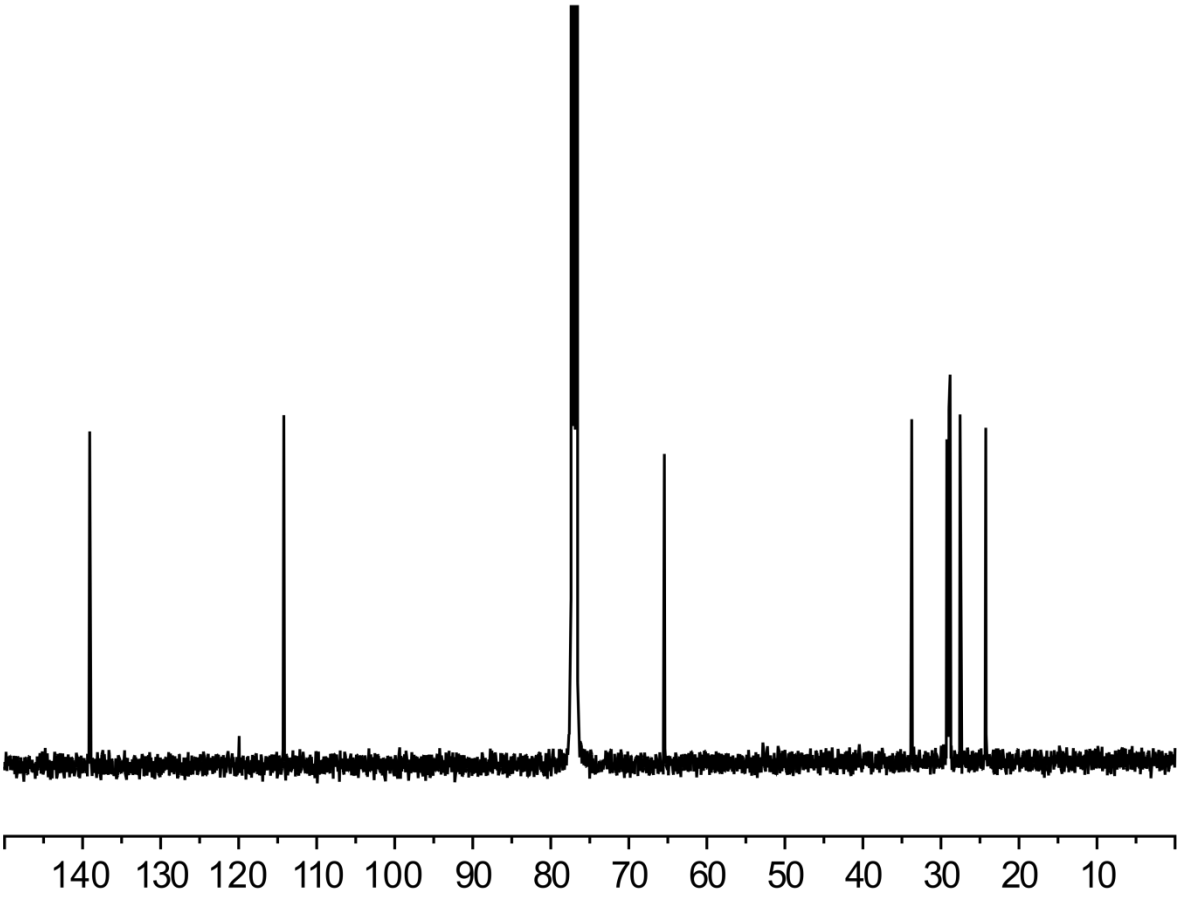
Spectrum **S5** ^{1}H-NMR spectrum of **P2** (360 MHz, $CDCl_3$)



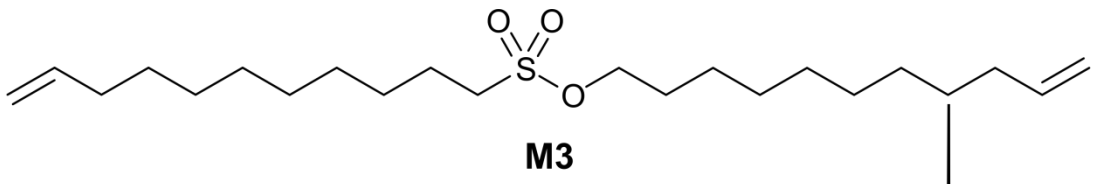
Spectrum **S6** ^{13}C-NMR spectrum of **P2** (90 MHz, $CDCl_3$)



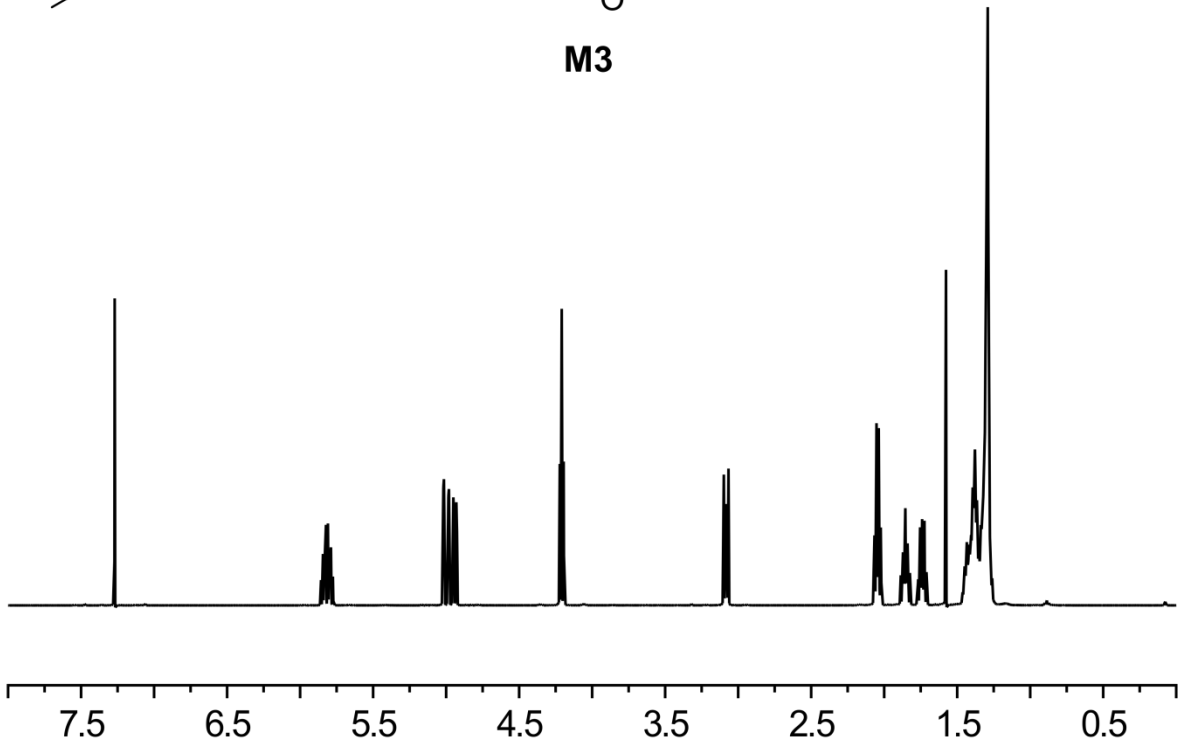
Spectrum S7 ^{1}H-NMR spectrum of **3** (500 MHz, $CDCl_3$)



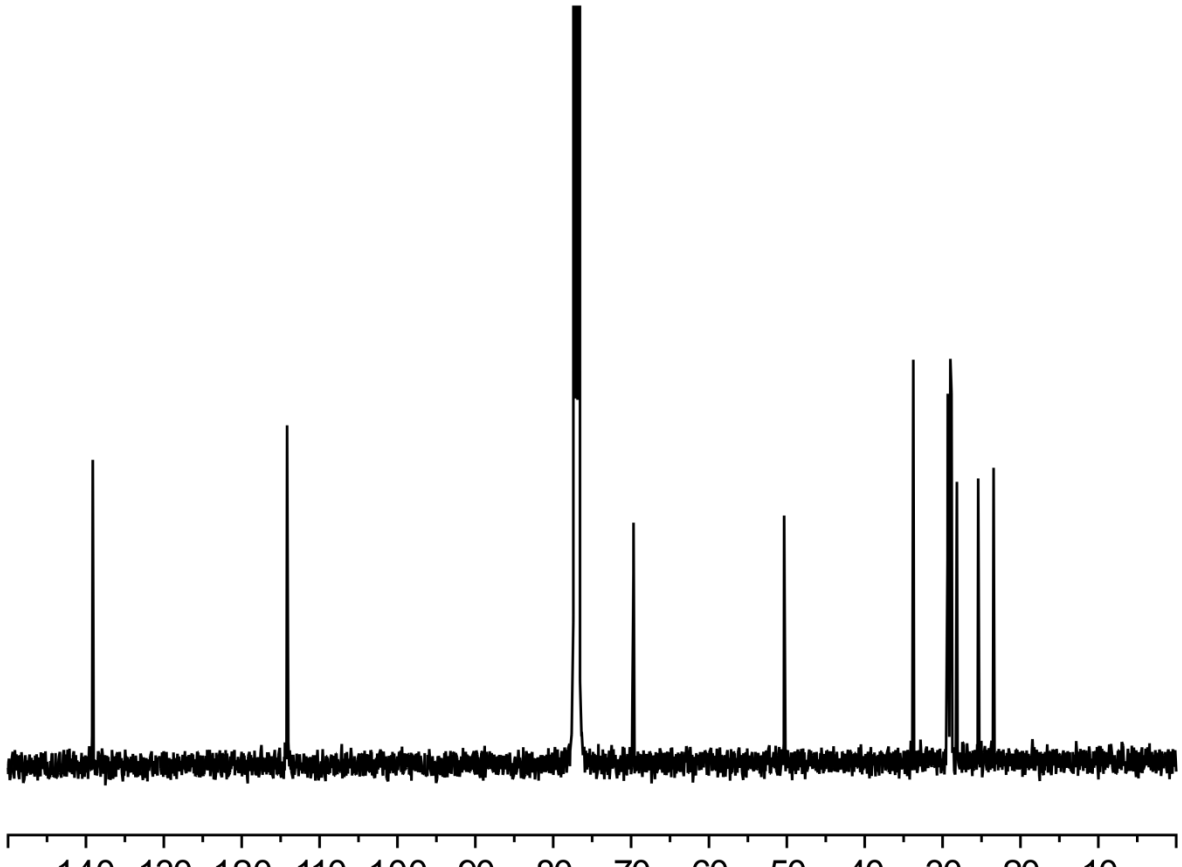
Spectrum S8 ^{13}C-NMR spectrum of **3** (125 MHz, $CDCl_3$)



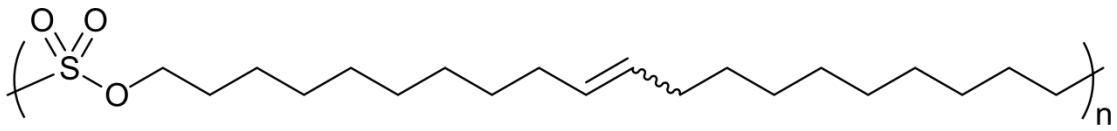
M3



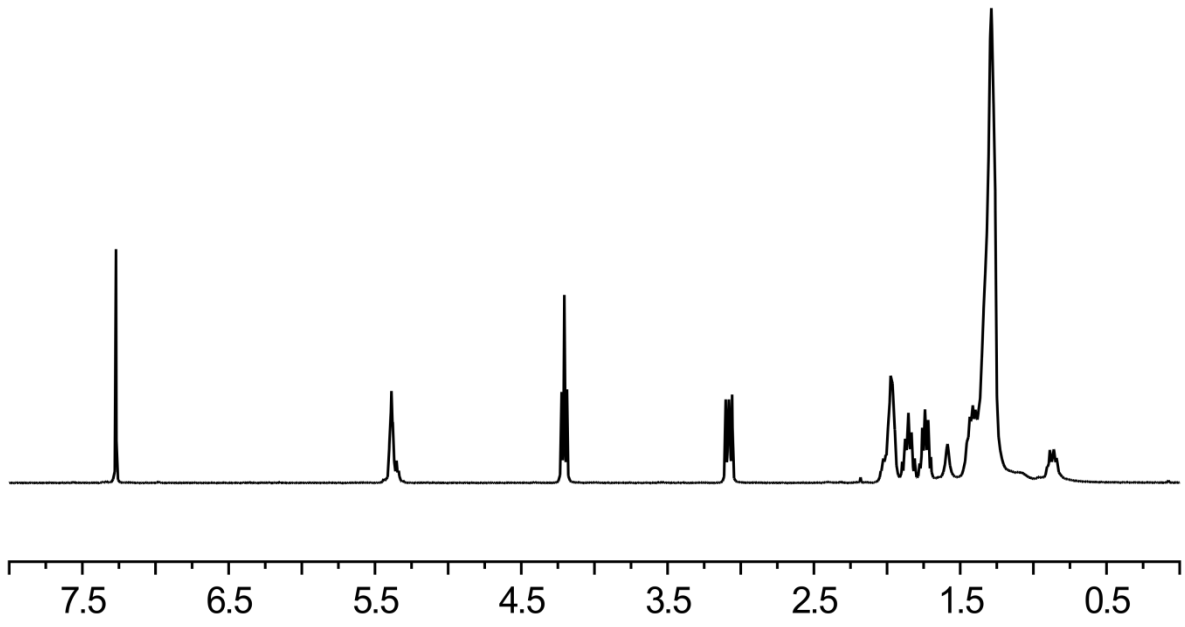
Spectrum S9 ^{1}H-NMR spectrum of **M3** (500 MHz, $CDCl_3$)



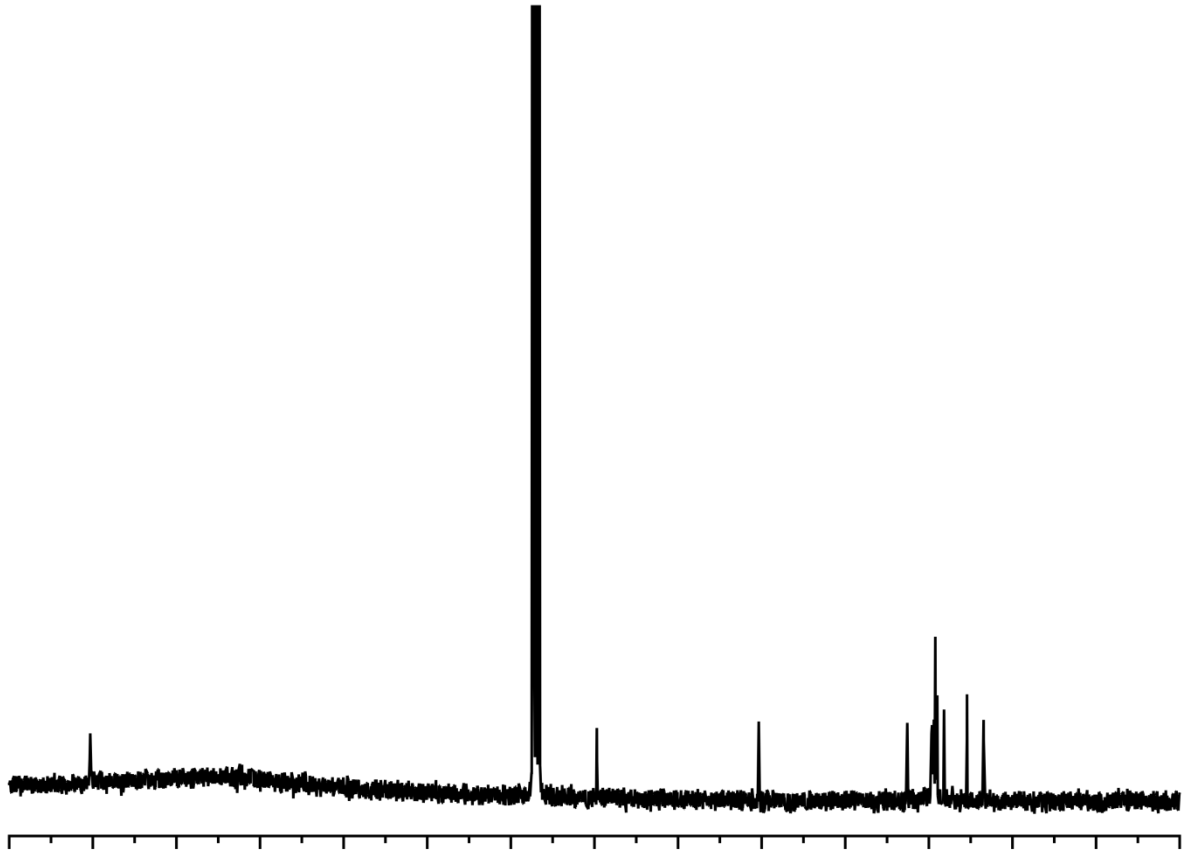
Spectrum S10 ^{13}C-NMR spectrum of **M3** (125 MHz, $CDCl_3$)



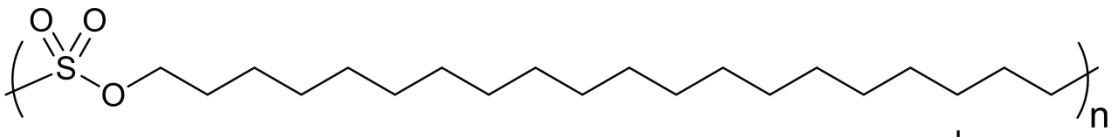
P3



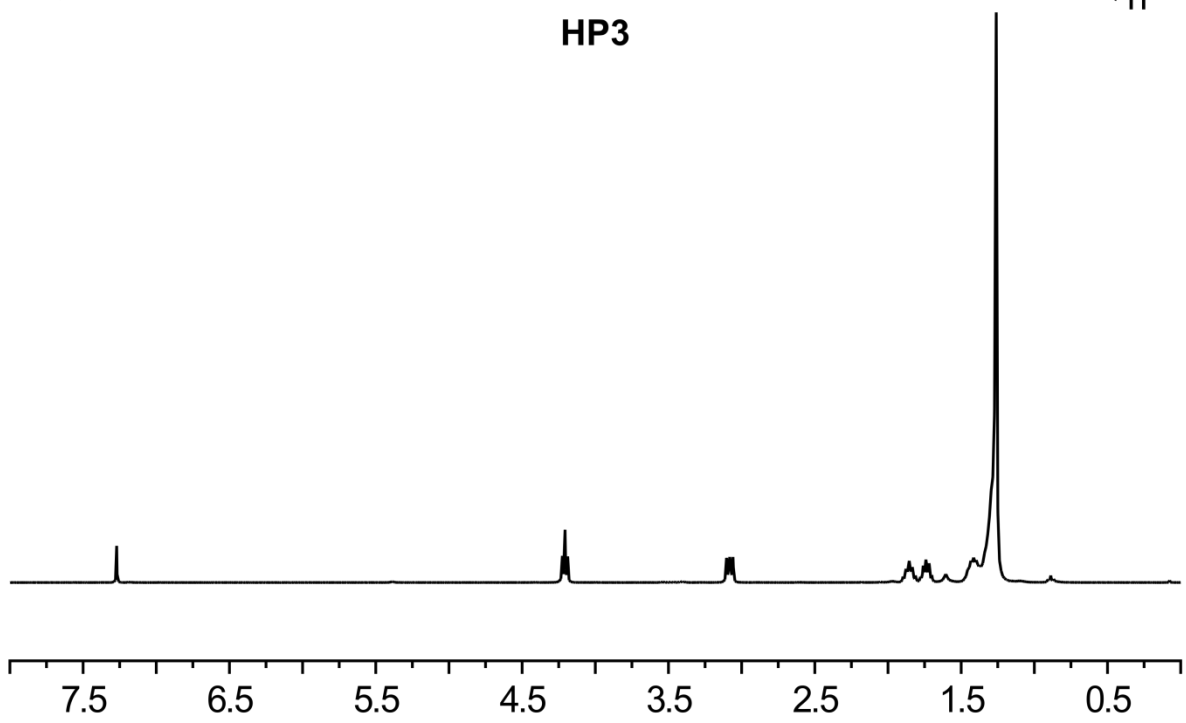
Spectrum S11 ^{1}H-NMR spectrum of **P3** (360 MHz, $CDCl_3$)



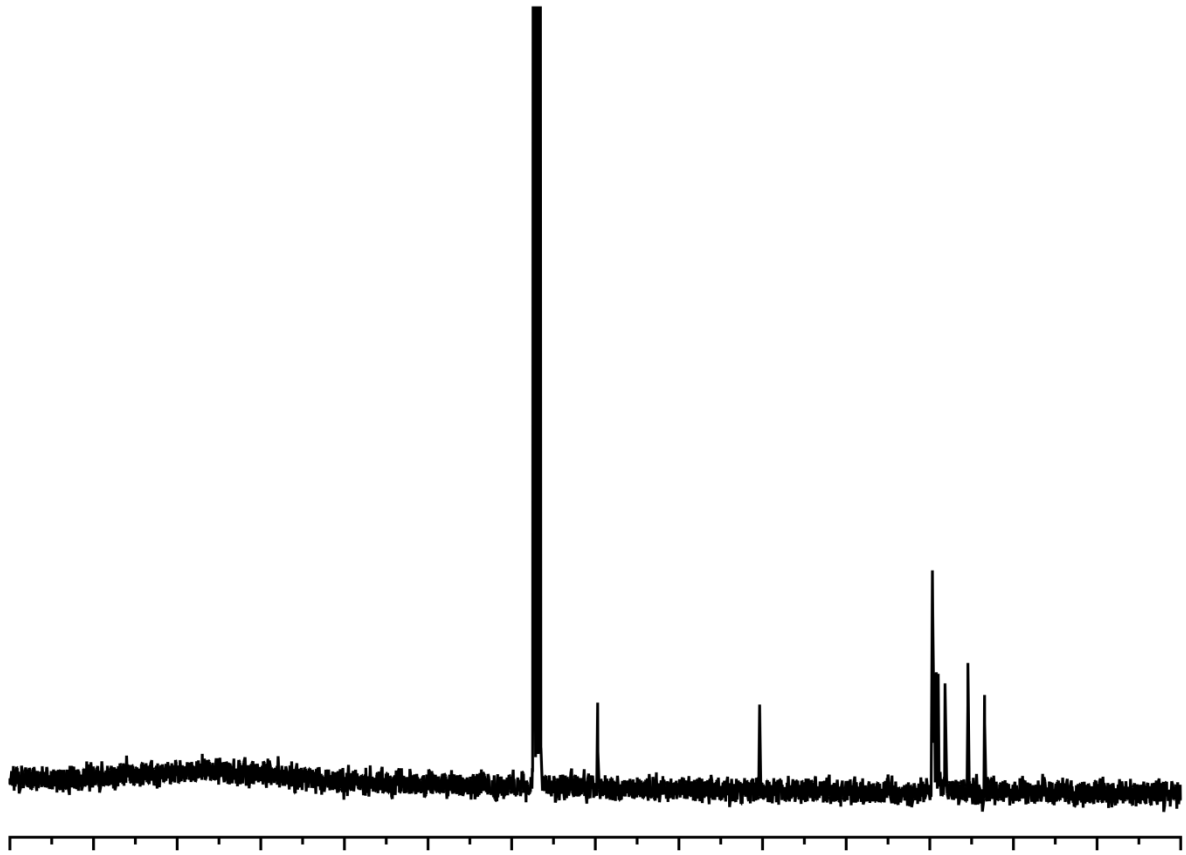
Spectrum S12 ^{13}C-NMR spectrum of **P3** (90 MHz, $CDCl_3$)



HP3



Spectrum **S13** ^{1}H-NMR spectrum of **HP3** (360 MHz, $CDCl_3$)



Spectrum **S14** ^{13}C-NMR spectrum of **HP3** (90 MHz, $CDCl_3$)

References

1. E. J. Corey, G. H. Posner, R. F. Atkinson, A. K. Wingard, D. J. Halloran, D. M. Radzik and J. J. Nash, *J. Org. Chem.*, 1989, 54, 389-393.
2. P. W. C. Barnard and R. E. Robertson, *Can. J. Chem.*, 1961, 39, 881-888.